

Size Dependent Magnetic and Electric Properties of Superoxygenated Free Standing La_2CuO_4 Nanoparticles

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La_2CuO_4 (LCO) is a perovskite oxide material and has been used for wide applications such as gas sensing,¹⁾ photocatalytic²⁾, memory resistive³⁾ and it is also based compound of superconductor material.⁴⁾ LCO has several phase transitions, which occurs depending on temperature, pressure and also dopant, such as metal or oxygen doping. By varying those conditions, the property of LCO can be controlled. In the present work, we reported: 1) to fabricate the superoxygenated LCO nanoparticles (NPs) (oxygen doped LCO) by sol-gel method and 2) to investigate the electric and magnetic property of the fabricated sample at variety temperature.

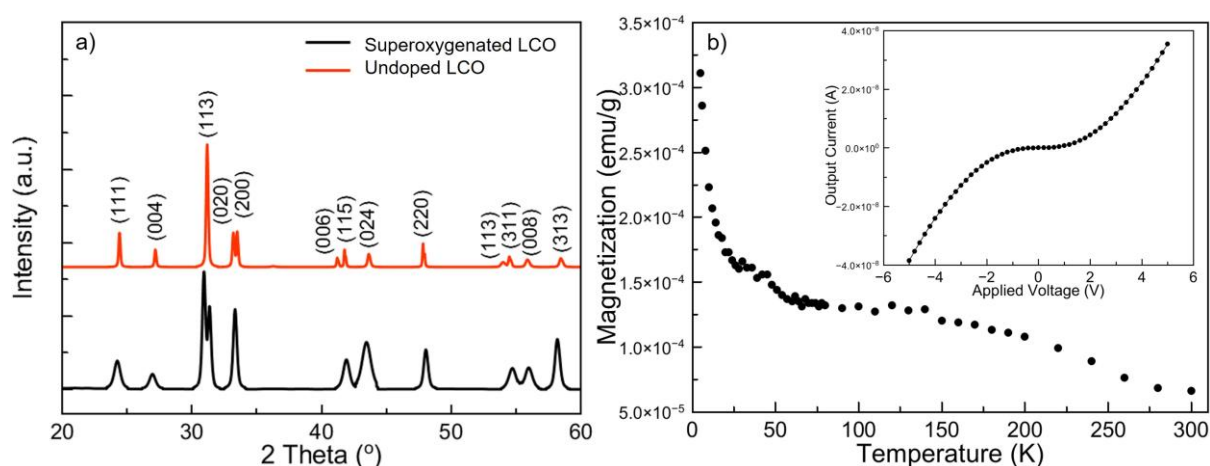


Fig. 1. (a) XRD profiles and (b) magnetic property of the superoxygenated LCO (inset in Fig. 1(b) is the I-V profile of sample at room temperature).

XRD profiles in Fig. 1 (a) reveal that the superoxygenated LCO sample caused the changed on the orthorhombicity in the structure (undoped LCO has orthorhombic structure (JCPDS: 38-0709)) indicating by splitting peak is shift from $\sim 33^\circ$ to $\sim 31^\circ$. The electric property of the sample was measured by probing system and the NPs was controlled by dielectrophoresis method. The I-V curve of the sample is presented in inset in Fig 1(b). It shows that the sample has semiconducting property. The magnetic property of the sample were measured by SQUID magnetometer and the result shows that unique paramagnetic behavior appears, as seen in Fig. 1 (b). The details will be presented at the conference.

Keywords: Superoxygenated La_2CuO_4 , nanoparticles, sol-gel, magnetic property, electric property.

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